

Elson Oil Company
422 Beacon Bldg.
Tulsa, Okla.

R. L. LANGENHEIM, JR.
DEPT. GEOL. UNIV. ILLINOIS
254 N. H. B., 1301 W. GREEN ST.
URBANA, ILLINOIS 61801

Press Bulletin Series

Issued Twice Quarterly

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
A. M. SHELTON, *Director*

DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief, Urbana*

No. 5

ILLINOIS PETROLEUM

October 16, 1926

CONTENTS

	PAGE
Oil investigations in the Centralia area—preliminary report concluded.....	1
Oil field water investigations—Waterloo field.....	11
Oil possibilities of the Ayers anticline.....	15
Current oil field operations in Illinois.....	18

OIL INVESTIGATIONS IN THE CENTRALIA AREA— PRELIMINARY REPORT CONCLUDED

By Alfred H. Bell

INTRODUCTION

The present paper on the Junction City dome and the Hoffman anticline is the conclusion of the preliminary report on the Centralia area which appeared in Illinois Petroleum No. 4. The aim is to present in brief form the more important data collected, so that operators may have the benefit of them at once without the delay necessary for the preparation and publication of a full report. The area has been described in a former publication of the Illinois State Geological Survey,¹ but further information about sub-surface conditions has necessitated some revision of the structure map which accompanied that report.

STRATIGRAPHY

The general remarks with reference to the stratigraphy of the Centralia area in the last preliminary report are applicable to the areas under present consideration. Briefly, they are as follows: The McLeansboro formation, between the base of the glacial drift and the top of Herrin (No. 6) coal, includes 500 to 550 feet of shales with some limestone, sandstone, and thin coals. The Carbondale formation, below the McLeansboro, with a thickness of about 300 feet, consists principally of shale. The oldest

¹ St. Clair, Stuart, The Centralia area: Illinois State Geol. Survey Bull. 35, pp. 70-71, 73, 1917.

of the Pennsylvanian strata in the area are sandstones, about 115 feet thick, of Pottsville age. They are unconformable on the Chester limestones, sandstones and shales of the Mississippian system.

In connection with the correlation of sands in the Chester group, it should be mentioned that the Chester section is known to differ considerably within relatively short distances, owing to the lenticular character of many of the beds. Long distance correlation of the "Stein" and "Benoist" sands is therefore open to question.

STRUCTURE

The accompanying structure maps are contoured on the top of Herrin (No. 6) coal. The map of the Junction City area (fig. 1) is based partly on well records and partly on a stadia survey of Glenridge mine (Marion County Coal Company) in NW. cor. NE. $\frac{1}{4}$ NE. $\frac{1}{4}$, sec. 31, T. 2 N., R. 1 E., made by the writer's party. This survey covered an area of about 3 square miles. The map of the Hoffman area (fig. 2) is based on well records.

JUNCTION CITY AREA

The strata in this area have been deformed by both folding and faulting. Two well defined anticlinal features are shown on the map (fig. 1): (1) the Glenridge anticline, apparently a nose, but possibly a dome whose apex is in S. $\frac{1}{2}$ sec. 25, T. 2 N., R. 1 W., and whose axis lies almost exactly along the "main west" entry of Glenridge mine; (2) the Junction City dome, dipping in all directions from an area in the NW. $\frac{1}{4}$ sec. 32, T. 2 N., R. 1 E. The axis of the nose produced passes through the dome; the continuity between them is broken by the intervening fault zone.

FAULTS

The faults form a parallel series having a north-south trend. The easternmost fault of the series has the greatest vertical displacement, namely 35 feet at a point about half a mile north of the south line of sec. 30, where the fault plane is nearly vertical, and 60 feet at a point 650 feet east of the mine shaft, where the fault plane dips 75° to the west. The downthrow is on the west side. The fault has been traced more or less continuously for about $2\frac{1}{2}$ miles north of the shaft of Glenridge mine; the displacement decreases northward to the end of the fault which is just south of the north line of S. $\frac{1}{2}$ sec. 18, T. 2 N., R. 1 E. (in the Sandoval mine). This fault forms the eastern boundary of the abandoned workings south of the shaft; it probably continues southward and connects with the fault on the east side of old No. 3 and No. 4 mines of the Centralia Coal Company in sec. 7, T. 1 N., R. 1 E., which is said to have

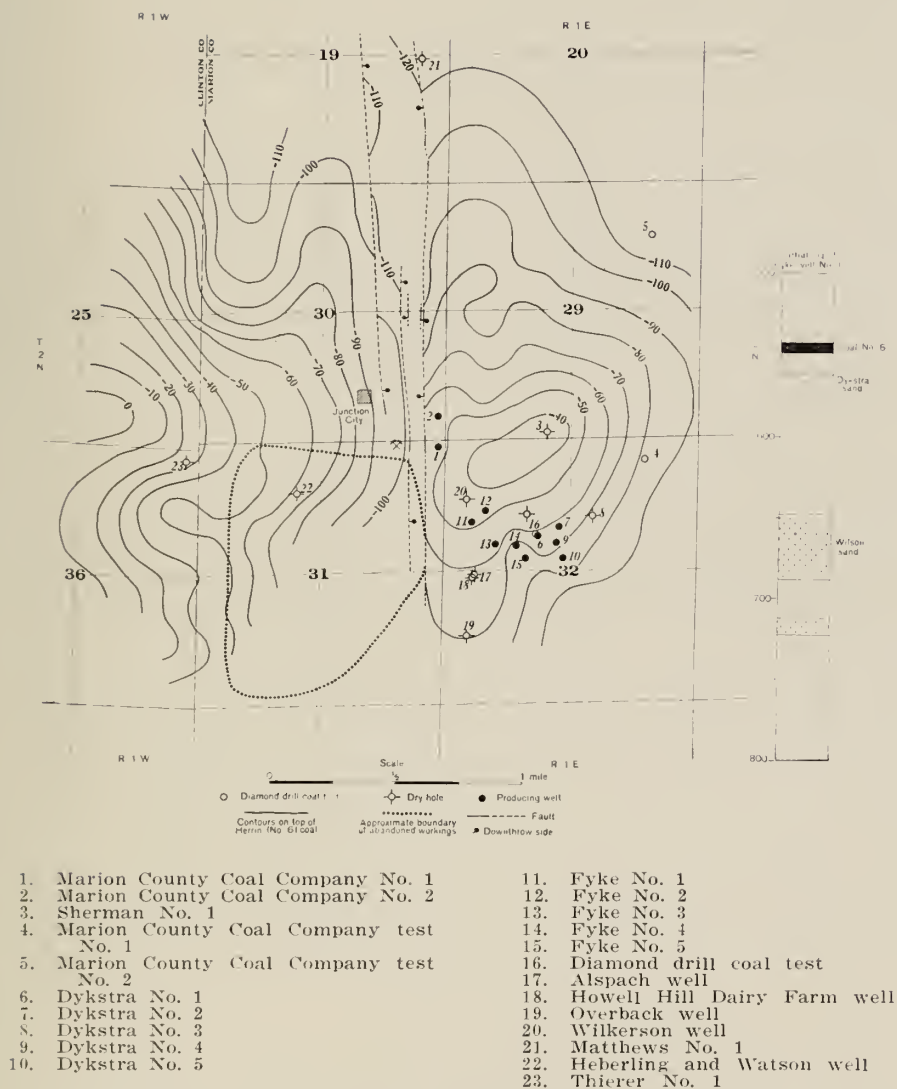


Fig. 1. Structure map of Junction City area, Marion and Clinton counties.
(Drawn by A. H. Bell and J. H. Markley, Jr., Illinois State Geological Survey.)

a displacement of 110 feet, with the downthrow on the west side². All of the other faults shown on the map have comparatively small vertical displacements. A description of these faults and a discussion of the possible influence of faults upon the accumulation or escape of oil and gas in the Centralia area are reserved for a later, more detailed report.

DEVELOPMENT

Prospecting for oil in the region was begun as a result of the observation of oil seepages along some of the faults in Glenridge mine.³ The Junction City oil field is situated on the south flank of the dome. Most of the drilling was done in 1911. The principal production is from the Wilson sand which is about 30 feet thick and has a stratigraphic position in the Carbondale formation about 110 feet below the Herrin (No. 6) coal, but some oil has been obtained from the Dykstra sand which is about 10 feet thick and 15 feet below No. 6 coal.

(1) *The Ohio Oil Company*. This company has four producing wells on the Dykstra lease which have been pumped for 15 years (Dykstra Nos. 1, 2, 4, and 5). For the past ten years the production has been nearly constant at the rate of about 18 barrels per week or an average of 0.64 barrel per well per day. Dykstra No. 3 was formerly pumped but is now abandoned.

Thierer No. 1 in the NE. cor. sec. 36, T. 2 N., R. 1 W., was drilled in 1910 to a depth of 1,685 feet. Sand believed to be the Benoist was found from 1,560 to 1,605 feet. The log records neither water nor a showing of oil in this sand. A note on the sample of cuttings from 1,640 to 1,645 feet is as follows: "black shale filled with petroleum, effervesces with acid"⁴.

A second deep test was drilled in 1919 to a depth of 1,636 feet on the Howell Hill dairy farm, 200 feet south and 600 feet east of the NW. cor. SW. $\frac{1}{4}$ sec. 32, T. 2 N., R. 1 E. Only a partial record of this well is available; it shows sand from 663 to 768 and from 1,597 to 1,614 feet. The latter was considered to be the Benoist sand. The log does not show either water or oil in this sand.

² Kay, Fred H., Coal resources of District VII: Illinois Min. Inv. Bull. 11, p. 136, 1915.

³ Diagrams showing the probable reason for the oil seepages are given in the following publications:

Blatchley, R. S., Illinois oil resources: Illinois State Geol. Survey Bull. 16, p. 145, 1910.

Kay, Fred H., Coal resources of District VII: Illinois Min. Inv. Bull. 11, p. 137, 1915.

⁴ Udden, J. A., Some deep borings in Illinois: Illinois State Geol. Survey Bull. 24, pp. 73-77, 1914.

(2) *Clear Creek Oil Company (Gorman and Wilson)*. The five wells on the Fyke lease have been pumped for 15 years and are now making a total of 4 barrels per day or an average of 0.80 barrel per well per day.

Matthews No. 1 in the NE. cor. SE. $\frac{1}{4}$ sec. 19, T. 2 N., R. 1 E., was drilled in 1922 to a total depth of 853 feet. It finished in a salt water sand which was topped at 850 feet. The Dykstra sand was found (618-623 feet) immediately below Herrin (No. 6) coal; the Wilson sand is absent. No showings of oil were recorded.

(3) *Forx and Alsbach and the Marion County Coal Company*. Two wells were drilled in 1926 a short distance east of the shaft of Glenridge mine with the double purpose of locating the coal east of the fault and of prospecting for oil. No. 1 is 75 feet south and 100 feet west of the NE. cor. sec. 31, T. 2 N., R. 1 E., and No. 2 is 450 feet north and 100 feet west of the SE. cor. sec. 30, T. 2 N., R. 1 E. These wells are now being pumped and make a total of about 2.5 barrels per day or an average of 1.25 barrels per well per day, from the Dykstra sand.

(4) *Marion County Coal Company diamond drill tests*. Besides the first diamond drill test made prior to the sinking of the shaft, close to the present location of the shaft, two other such tests have been made by this company: No. 1, 500 feet south and 1,100 feet west of NE. cor. sec. 32; No. 2, 1,100 feet south and 1,000 feet west of NE. cor. sec. 29, both in T. 2 N., R. 1 E.

(5) *Marion County Oil and Gas Company*. Sherman No. 1, 100 feet north and 2,200 feet east of the SW. cor. sec. 29, T. 2 N., R. 1 E., was drilled about 1910 and the record is not now available. The elevation of No. 6 coal was calculated by using the depth given by Blatchley⁵ and the surface elevation determined by stadia survey. According to St. Clair this well was drilled only to the Dykstra sand, and the Wilson and deeper sands were not tested here.⁶

Table 1 summarizes the available data from the wells in the Junction City area.

RECOMMENDATIONS

Neither the Junction City dome nor the Glenridge anticline appears to have been thoroughly tested. The only deep test on the former structure was located half a mile south of the apex and the coal was found 25 feet lower than in the Sherman well. The Ohio Oil Company's Thierer well is a quarter of a mile east of the highest known part of the Glenridge anticline, at a point where No. 6 coal is at least 30 feet lower than at the

⁵ Blatchley, R. S., op. cit., p. 141.

⁶ St. Clair, Stuart, op. cit., p. 71.

TABLE 1.—Data from wells in the Junction City area

Map number	Company	Lease	Well number	Coal No. 6		Dykstra sand		Wilson sand	
				Surface elevation	Depth	Elevation	Interval between top of No. 6 coal and top of Dykstra sand	Thickness	Interval between top of No. 6 coal and top of Wilson sand
1	Fox and Alspach	Marion County	1	492	548	-56	12	10	Well drilled 142 feet below No. 6 coal; Wilson sand not found
2	Fox and Alspach	Coal Company	2	490	543	-53	19	10	not tested
3	Marion County Oil and Sherman Gas	Coal Company	1	500	536	-36	present but record not available	—	not tested
4	Marion County Coal	Diamond drill test	1	468	548	-80	0	25?	122
5	Marion County Coal	Diamond drill test	2	500	615	-115	not tested	—	not tested
6	Ohio Oil	Dykstra	1	470	532	-62	10	5	115
11	Clear Creek Oil	Fyke	1	493	542	-49	20	10	106
12	Clear Creek Oil	Fyke	2	492	538	-46	17	11	107
13	Clear Creek Oil	Fyke	3	489	545	-56	13	11	113
14	Clear Creek Oil	Fyke	4	476	548	-72	absent	—	109
15	Clear Creek Oil	Fyke	5	475	546	-71	absent	—	100
17	Alspach	Howell Hill Dairy Farm	488	488	549	-61	16	7	110
							(show oil)		40 (show oil)

18	Ohio Oil	Howell Hill Dairy	489	552	-63	not recorded	114	105 (?) (total)
20	Alspach	Farm						
		Wilkerson	493	536	-43	21	123	18 (total)
21	Clear Creek Oil	Matthews	1	497	-115	(show oil)		(show oil)
23	Ohio Oil	Thierer	1	491	-29	0		absent
				520		absent	130	120 (?) (total)

The logs for the following wells were not available:

Ohio Oil Company, Dykstra Nos. 2, 3, 4, and 5.

Heberling and Watson.

Marion County Oil and Gas Company, Sherman No. 1.
Overback.

apex. Both of these structures still have possibilities of production from the Benoist or other sands in the lower part of the Chester. In order to test these thoroughly, wells should be drilled to the top of the "Mississippi lime" (St. Louis and Ste. Genevieve limestones). Since the deepest well in the vicinity, the Thierer, did not reach this horizon, the depth at which it may be expected is somewhat doubtful but it will probably be found not much deeper than 1,700 feet.

The possibility of finding productive sand bodies on the slopes of structures on No. 6 coal similar to those found in the Langewisch and Kuester pools east of Central City, should not be overlooked for the Junction City dome. The Howell Hill Dairy Farm well appears to condemn the south flank but the east, northeast and north flanks of this dome still remain untested for the deeper sands.

The possibilities of further Wilson sand production from the Junction City dome appear to be good. The fact that the Wilkerson well and the well 1,800 feet east and 1,700 feet south of the NW. cor. of sec. 32, of which the log is not available, were not producers does not necessarily mean that Wilson sand production cuts off to the north; these wells may possibly have been in localities where the porosity of the sand is low. Moreover, as stated above, the Sherman well was not drilled below the Dykstra sand. The greater part of the area enclosed by the 70 foot contour may yet be found to yield small production from the Wilson sand. Further drilling east of the two Fox and Alspach wells, NE. cor. sec. 31 and SE. cor. sec. 30, T. 2 N., R. 1 E., may extend the Dykstra sand production in this direction.

HOFFMAN AREA

Several wells have been drilled in the vicinity of Hoffman where an anticlinal structure is known to exist.⁷ One of these, Eichoff No. 1, located in the NW. cor. NE. $\frac{1}{4}$ sec. 12, T. 1 N., R. 2 W., is reported to have had a showing of oil. According to the log this well had sands as follows:

<i>Sand record</i>		
From	To	
<i>Feet</i>	<i>Feet</i>	
640	760	(Pottsville)
918	942	
953	1022	
1025	1040	
1123	1130	
1240	1298	
1345	1373	(Oil 1345-1347; water 1347-1372.)

⁷ St. Clair, Stuart, op. cit., p. 73.

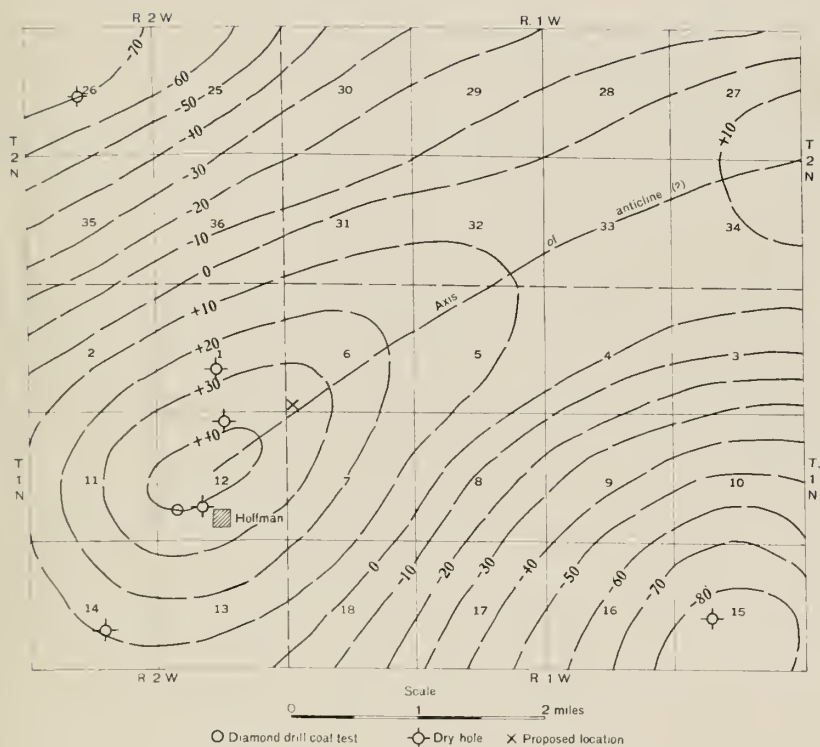


Fig. 2. Structure map of the Hoffman area, Clinton County. Contours drawn on top of Herrin (No. 6) coal. (Drawn by A. H. Bell and J. H. Markley, Jr., Illinois State Geological Survey.)

The oil and water sand is 933 feet below the Herrin (No. 6) coal and is therefore about at the horizon of the Benoist sand at Sandoval.⁸

The Sprehe well, SW. $\frac{1}{4}$ sec. 1, T. 1 N., R. 2 W., showed the following:

	From <i>Feet</i>	To <i>Feet</i>	
Sand	802	806	Small showing of oil
Sand	1270	1272	Small showing of oil and gas
Lime, sandy	1316	1318	Showing of oil
Sand	1344	1349	Water

The last named sand corresponds to the oil and water sand from 1,345-1,353 feet in the Eichoff well.

Benoist Brothers and others have made a location in the SW. cor. sec. 6, T. 1 N., R. 1 W., and expect to commence drilling in the near future.

STRUCTURE

Figure 2 shows the structure of Herrin (No. 6) coal in the Hoffman area so far as it is known. From an area in sec. 12, T. 1 N., R. 2 W., the coal dips in all directions. On account of the scarcity of wells there is considerable uncertainty about the structure especially east and northeast of Hoffman.

RECOMMENDATIONS

It seems probable that an anticlinal axis connects the Hoffman dome with the Glenridge anticline and Junction City dome. If this is true, the intervening area along the axis has fair possibilities of oil production. It would be very desirable, however, to determine more definitely the structure in this area before making the expenditure necessary for one or more deep tests. For this purpose, it is recommended that a number of test holes be drilled to Herrin (No. 6) coal and then, if favorable structure is found, to drill to the Benoist sand, or preferably to the top of the "Mississippi lime" (St. Louis and Ste. Genevieve limestones) in order to test all sands above the base of the Chester group. As has been pointed out in a former publication⁹ such procedure is, in the long run, more conclusive and less expensive than the haphazard drilling of deep tests. In view of the fact that only a few tests have been drilled in this area and that the most favorable parts of the structure may be undiscovered at the present time, this plan of prospecting promises a fair chance of success.

⁸ St. Clair, Stuart, op. cit., p. 72.

⁹ Moulton, G. F., Proper testing for oil structures in Illinois and some areas deserving such testing: Illinois State Geol. Survey Report of Investigations No. 6, pp. 6-9, 1925.

OIL FIELD WATER INVESTIGATIONS—WATERLOO FIELD

By Gail F. Moulton

In some of the wells of the Waterloo field, Monroe County, Illinois, trouble with water has become serious enough to threaten their productive life. An investigation of the field was undertaken in 1925 and samples of the water produced with the oil in representative wells distributed over the producing area were sent to the laboratory of the State Water Survey for analysis. The results of the investigation are herewith presented in order that the operators in the field may benefit therefrom.

The accompanying map (fig. 3) prepared by J. E. Lamar of the State Geological Survey shows the structure of the Waterloo field and the locations of some of the wells with special symbols for those which were sampled. The structure which has caused the oil accumulation is a pronounced anticline elongated in a north-south direction. The producing wells are located along the highest part of the fold. The best production has been found a short distance south of the north dip in the southern part of section 35. Apparently the "Trenton", which is the producing horizon, has a greater porosity in this part of the field than farther south.

The character of the water samples taken in the field was very consistent except in the matter of concentration of the brines. Two typical analyses are graphically represented in figure 4, and the general character and concentrations of all of the samples are given in Table 1.¹ A glance at this table will show the great consistency of the character of the brines.

It is apparent from the analyses that the oil-field brines have a common source. Since it is known that some of the wells sampled were drilled through the oil-producing zone into the water-bearing horizon beneath, it is concluded that all of the salt water comes from the lower part of the oil sand. In a few wells the lower concentration of the brine indicates that there is dilution by fresh surface waters which are getting into the wells through defective casing.

The handling of the wells in the north end of the pool is one of the biggest problems now confronting the operators in the Waterloo field. Here the wells which produce large quantities of water have a decided effect on each other. In case certain wells in section 35 are shut down some of those in the northern part of section 2 lose their oil production and pump nothing but salt water. These latter wells have a somewhat similar effect on the wells in section 35. Unfortunately these same wells

¹ See Palmer, Chase, *The geochemical interpretation of water analyses*: U. S. Geol. Survey Bull. 479, 1911, for the method of expressing analyses.

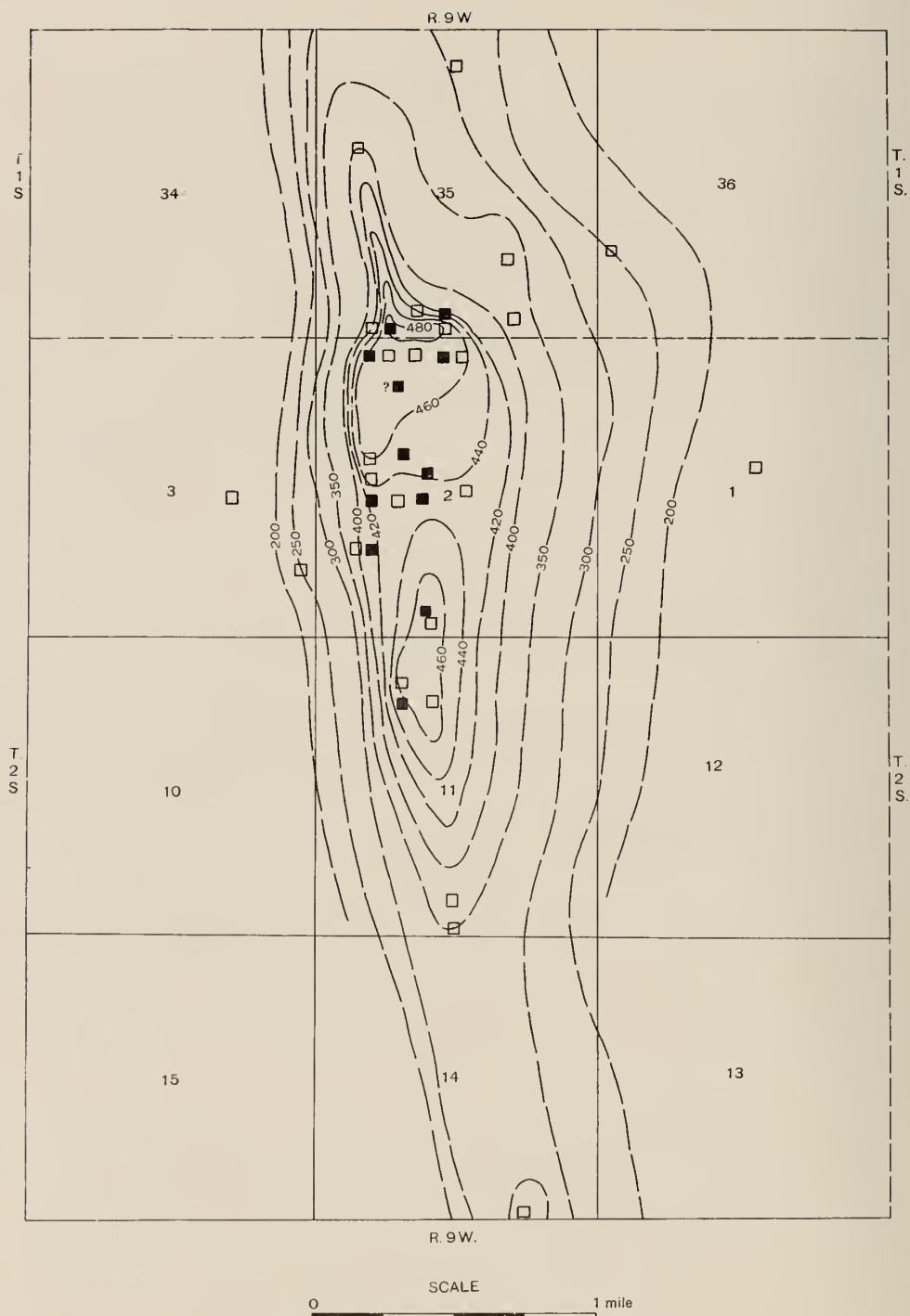


Fig. 3. Structure map of the Waterloo oil field with contours drawn on top of the Fern Glen limestone. (Drawn by J. E. Lamar, Illinois State Geological Survey.) Locations of wells are indicated by squares. Solid squares indicate wells from which water samples were taken.

WATER INVESTIGATIONS IN WATERLOO FIELD

TABLE 1.—Summary of results of investigations of water conditions in certain wells in the Waterloo oil field, Monroe County

Farm name	Well No.	Amount of water	Condition of well	Water character		
				Concentration milligrams per liter <i>Per cent</i>	Primary salinity <i>Per cent</i>	Secondary salinity <i>Per cent</i>
J. Acker	4	Little	Good	15,480	75.	21.8
J. Acker	3	Little	Some surface water leaks in	5,955	73.9	21.6
J. Acker	2	Little	Good	15,680	74.9	22.4
H. Kolmar	6	12 bbls.	Good	13,800	74.5	22.7
Gaertner	5	10 bbls.	Some surface water leaks in	7,295	72.3	19.4
Gummerscheimer	3	20 bbls.	Poor	15,560	74.6	22.4
Kolmar	3	65 bbls.	Needs cementing	17,620	71.3	27.7
Gaertner	3	30 bbls.	Some surface water leaks in	9,235	73.7	17.6
J. Gummerscheimer	3	Large flow	Needs cementing	14,180	76.7	20.3
H. Kolmar	8	Large flow	Needs cementing	15,550	74.3	23.1
Robert Frierdich	10	Large flow	Needs cementing	15,090	74.0	23.0
Gummerscheimer	7	Very little	Casing leaks	5,272	71.8	20.0
Lena Acker	8	15 bbls.		16,040	74.6	22.8
						2.6

make the most oil when pumping continuously, so that it seems more worthwhile to repair than to abandon them.

The conditions in this group of wells are probably due in large part to the fact that they were drilled too deep. It seems probable that there is a tighter layer between the oil-bearing porous zone and the water-bearing porous zone. Only one of the well logs indicates this condition, but the behavior of the wells appears to corroborate the idea.

During the first part of the producing life of the wells the pressure of the oil was great enough to force oil into the wells even against the back pressure of a moderate amount of water. The removal of oil was fairly rapid at first without appreciable replacement of oil or gas from distant portions of the reservoir. Consequently, the pressure in the oil-bearing porous zone was considerably reduced.

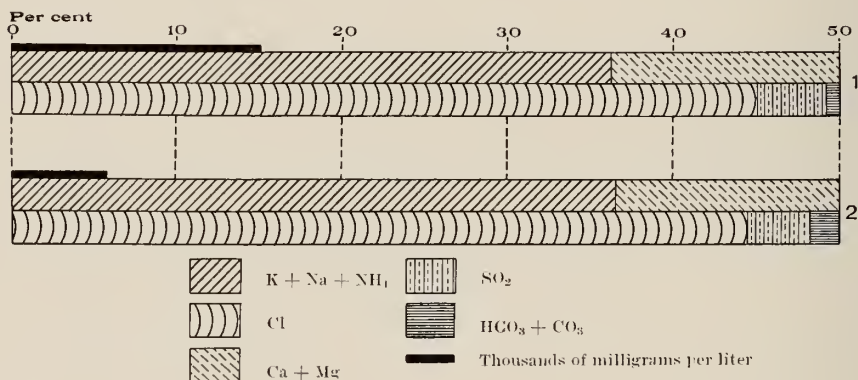


Fig. 4. Graphic analyses of typical water samples from the Waterloo oil field.
(Drawn by G. F. Moulton, Illinois State Geological Survey.)

In the water-bearing porous zone there was a removal of considerable amounts of fluid also, but replacement from sources outside of the local area served to maintain the pressure in the field. At the present time there is a much greater pressure in the water-bearing porous zone than in the oil-producing porous zone. This condition is believed to explain the great interference among certain wells. It is believed that the water-bearing zone is highly porous between a few of the wells near the north line of section 2 and that the pumping capacity of these wells is only slightly in excess of the capacity for fluid transmission of the water-bearing porous zone around the wells under the existing pressure conditions. Consequently, when one or two of these wells stops pumping, the water comes into the area faster than it is being removed, builds up pressure in the

wells in excess of the pressure on the oil and thus keeps oil out of the well.

The remedy for these conditions is cementing off the water-bearing porous zone in the wells which are making large amounts of water. In cementing off the water-bearing porous zone it might well be noted that any of the uncemented wells which pump large quantities of water at present will probably lose their oil production and start flooding the oil sand. Such flooding should do much to increase the production of the properly drilled and repaired wells for it would restore the pressure on the oil sand in adjacent portions of the pool. The probable result would be the greater and more rapid recovery of oil than present operating conditions make possible. In case repair work by cementing is undertaken, the State Geological Survey will be glad to give its cooperation.

Certain wells showed a low brine concentration in the water analysis which indicates that surface water is leaking in. When the field work was done, however, none of these wells was making enough water to justify repair work. In case the amount of water pumped from any well increases very much, a sample should be sent in to the State Geological Survey for tests to determine whether the water is from the oil sand or from the surface. Consultation with the State Geological Survey in regard to wells not mentioned in this report is invited.

OIL POSSIBILITIES OF THE AYERS ANTICLINE

By Alfred H. Bell

GENERAL STATEMENT

Among Illinois structures which merit further testing for oil, the Ayers anticline in Bond County deserves consideration. In an earlier publication¹ this structure is shown by contours with a 50-foot interval; the accompanying map (fig. 5) represents it in greater detail by means of contours with a 10-foot interval. The key-bed used is Herrin (No. 6) coal. The axis of the anticline trends east and west. The strong dips to the south in secs. 28, 29, 30, 31, 32, and 33, T. 6 N., R. 3 W., and to the north, in secs. 21, 16, and 11, T. 6 N., R. 3 W., have been determined with considerable certainty. Owing to lack of data, the detailed structural features in sec. 24, T. 6 N., R. 4 W., and secs. 19 and 20, T. 6 N., R. 3 W., which sections appear to lie on the highest part of the anticline, are not so well known.

¹ Blatchley, R. S., Oil and gas in Bond, Macoupin, and Montgomery counties, Illinois: Illinois State Geol. Survey Bull. 28, Pl. II, 1914.

DEVELOPMENT

(1) *The Bond County Gas Company* has drilled 6 wells in sec. 28, T. 6 N., R. 3 W., 5 of which produce gas intermittently. The sixth (near the NW. corner NE. $\frac{1}{4}$) had water in the gas sand. The producing horizon is a sand at approximately 900 feet, in the Chester series. Although logs of these wells are not available, it seems probable that the producing sand is the same as that in the Lindley gas field 6 miles south.

(2) *The Ohio Oil Company*. Two wells have been drilled by this company in the area mapped: 1. The Sapp well in N. $\frac{1}{2}$ NE. $\frac{1}{4}$ sec. 21, T. 6 N., R. 3 W., total depth 1,100 feet; 2. the well in the center N. $\frac{1}{2}$ NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 28, T. 6 N., R. 3 W., of which the log is not available.

(3) *Snowden Brothers*. A well was drilled to a depth of 898 feet on the M. C. Huber farm in sec. 15, T. 6 N., R. 4 W., in 1914. The "Mississippi lime" was topped at 834 feet. No. 6 coal is not recorded in the log but its position may be inferred by using other beds for correlation.

POSSIBLE PRODUCING HORIZONS

The following table lists the possible producing horizons in the area with the probable depth at which the top of each may be found.

Depth Feet	Horizons	Remarks
400	1. Pennsylvanian sands below Her- rin (No. 6) coal	Produce oil at Junction City and Wamac; oil and gas at Carlin- ville; and gas at Staunton.
800	2. Chester	Oil at Frogtown, Carlyle, Sandoval and Centralia; gas in Bond Coun- ty, (1) sec. 28, T. 6 N., R. 3 W. (fig. 5), and (2) Lindley pool, sec. 22, T. 5 N., R. 3 W.
900	3. Ste. Genevieve (upper part of "Mississippi lime"); corre- lated with "McClosky sand"	Oil in Lawrence County.
2000	4. Devonian or Silurian	Showings of oil in wells in Old Ripley Township (south of Ayers anticline).
	5. Silurian: "Niagara lime" and Hoing sand	Gas in Pike County (Pittsfield- Hadley anticline) and oil at Col- mar.
2650	6. Ordovician: Kimmswick-Plattin limestone ("Trenton lime- stone")	Oil at Waterloo.

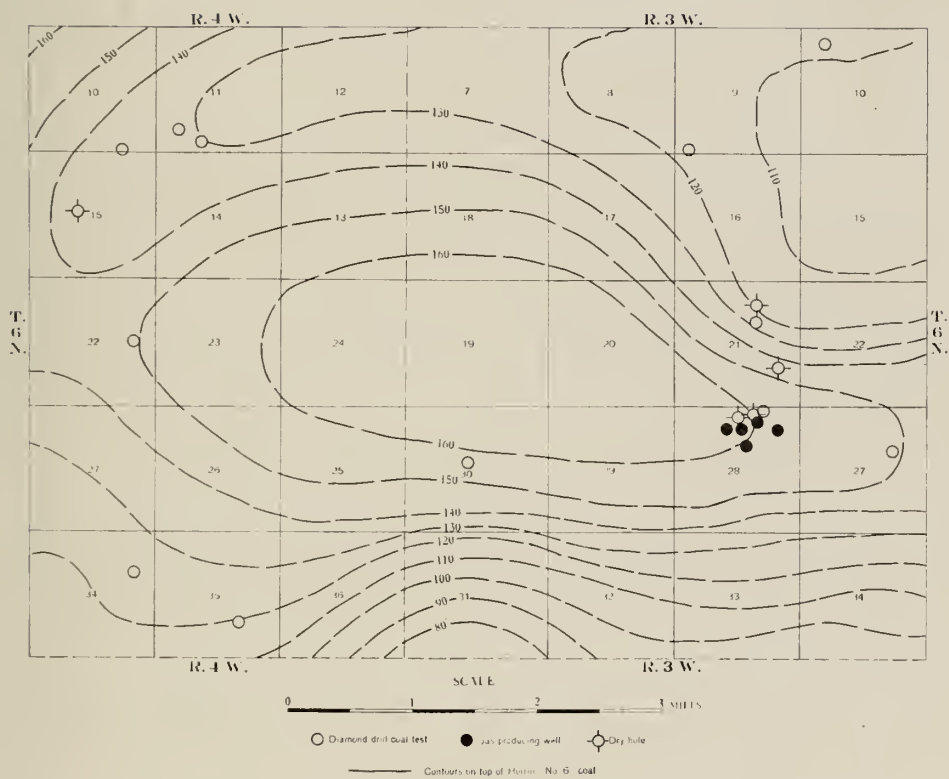


Fig. 5. Structure map of Ayers anticline, Bond County. (Drawn by A. H. Bell Illinois State Geological Survey.)

RECOMMENDATIONS

Since only one deep test in the area was favorably located with respect to structure, the Ayers anticline appears to merit further testing for oil. The most favorable acreage, so far as available data indicate, comprises sec. 24, T. 6 N., R. 4 W., and secs. 19, 20, N. $\frac{1}{2}$ sec. 30, and N. $\frac{1}{2}$ sec. 29, T. 6 N., R. 3 W.

Before locating a deep test it would be advisable to determine structure more fully by drilling three or four shallow tests to No. 6 coal, distributing them over secs. 24, T. 6 N., R. 4 W., 19 and 20, T. 6 N., R. 3 W. It would be preferable to make these tests by core drill, although churn drill tests would answer the purpose if the logs were carefully kept.

A consideration of the table of possible oil horizons leads to the conclusion that the best chance for production is in the Chester sands, since they furnish the oil and gas in the pools nearest the area described in this report. A thorough test, however, should extend to the top of the "Trenton" limestone.

In case test drilling is undertaken for the determination of structure, the Survey will be glad to render assistance by running elevations on the wells and in the interpretation of results by examining cores or cuttings and correlating the logs.

CURRENT OIL FIELD OPERATIONS IN ILLINOIS

By H. C. Spoor, Jr.

Wabash and Clark counties continue to have a dominant share in new drilling. Wabash County led with a total of 29 completions of which 12 were dry and 17 were wells with a total initial production of 1,737 barrels, or an average of 102 barrels per well. The important additions to producing territory were the east and west parts of sec. 6, T. 1 N., R. 11 W. Activity was particularly great on the Mark Madden, Collison Heirs, and Catherine Keyser farms. New activity of equal importance is likely to be started soon as a result of the new wells near the Gher farm along Wabash River.

In Clark County 13 completions gave a total initial production of 233 barrels from 8 producers which averaged 29 barrels each. Noteworthy features in this area are that the attempt of W. C. McBride, Inc., to extend the producing area to the south failed and that the main productive area is largely drilled up. A considerable falling off of new work is to be expected as a result.

The completion of a small well at shallow depth in Morgan County may result in some new work there. Otherwise, with the exception of Wabash County, there is no great activity at the present time.

Table 1 gives a summary of operations for a period of three months ending September 30.

TABLE 1.—Summary of current oil field operations in Illinois

Location			Company	Farm and well No.	Production		Remarks
County	Township	Section			Bbls.	Depth Feet	
Southeastern Field							
Clark (Martinsville pool) Completions:	Casey	24	Ohio Oil Company	J. Y. Smith No. 7	Dry	.....	Deepened to Niagaran.
		25	Gillette Oil Company	Wm. Risinger No. 3	10	1604	
		25	Arkansas Fuel Oil Company	Com-A. W. Baker No. 2	30	1598	Carper and Niagaran sands.
		25	Trenton Rock Oil and Gas Company	Wm. Slater No. 1	Dry	1600	Carper and Niagaran sands.
		25	Holmes, et al	Chas. Lowe No. 3	Dry	1390	Carper sand only.
		26	W. C. McBride, Inc.	Jas. Rush No. 25	Dry	.....	Carper sand only.
		30	Mahutska Oil Company	Widow McClelland No. 4	50	1593	Carper and Niagaran sands.
		30	Trenton Rock Oil and Gas Company	S. W. McClelland No. 4	50	1587	Carper 1333-1400; Niagaran 1545-1587.
		30	Trenton Rock Oil and Gas Company	E. R. Auld No. 9	.....	1602	Cleaning out.
		31	Ohio Oil Company	Wm. Morgan No. 4	15	1525	Carper and Niagaran sands.
	31	Ohio Oil Company	Wm. Morgan No. 5	8	1566	Carper and Niagaran sands.	
	31	Smith, Wilson, et al	Wm. Slater No. 3	50	.....		

TABLE 1.—Summary of current oil field operations in Illinois—Continued

Location			Company	Farm and well No.	Production		Remarks
County	Township	Section			Bbbs.	Depth <i>Feet</i>	
Drilling:	Orange	6	W. C. McBride, Inc.	Alex Beasley No. 1	Dry	1450	
	Johnson	13	W. C. McBride, Inc.	Theo. Bennett No. 1	.....	.....	
	Martinsville	31	Mahutska Oil Company	T. J. Ramsey No. 4	.....	.....	
	Wabash	7	W. D. Albin	R. Hodson No. 1	.....	.....	Shut down.
	Ashmore	2	Shrider et al	L. Houghton No. 1	.....	1035	Standing.
Coles	Charleston	25	Block Oil Company	E. Blakeman No. 1	.....	2420	Standing.
Crawford							
Completions:	Honey Creek	31	Phipps and Young	J. D. Reavill	5	956	
	Martin	12	Frost Oil Company	A. W. Mann	4	959	
		12	J. S. Abbott et al	L. M. Highsmith	Dry	1048	
	Montgomery	15	Squires Brothers	G. P. Ford	Dry	.....	Made pressure well.
	Prairie	26	Bell Brothers	Wiley Lamb	1	937	
Drilling:	Honey	7	McDowell et al	O. Lawrence	.....	965	Cleaning out.
	Creek						
		17	Campbell et al	J. E. Cullom	.....	.....	Drilling.
		31	Selby and Cisler	D. A. Reavill	.....	944	Cementing.
		31	Ohio Oil Company	J. D. Reavill No. 17	.....	.....	
	Oblong	5	Brunneman and McDon-ald	Geo. Zeigler	.....	.....	
Cumberland	Crooked	7	Huston et al	J. Davis	.....	.....	
	Creek						
Jasper		18	Huston et al	J. Kelly	.....	.....	
	Union	2	Campbell, Peck, et al	M. Clements	.....	.....	
	Grandville	17	Wimset, Hood et al	C. D. Decker	.....	.....	

Lawrence	Bridgeport	17	Snowden and McSweeney	C. A. Donnell Heirs No. 41	10	.....
		20	Big Four Oil and Gas Company	Ellen Lutz	10	.....
	Dennison	21	Ohio Oil Company	Ellen Lutz No. 7	.....	.....
		27	Ohio Oil Company	W. E. Robins No. 16	.....	.....
		36	Bruner Oil Company	W. H. Dining	.....	Completed.
	Lukin	22	Frank Ellison	B. Eason	.....	Rigging up.
Wabash						
	T. I. N., R. 11 W.	6	Adams Corners Oil Company	W. O. Johnson No. 1	150	1344
		6	Adams Corners Oil Company	W. O. Johnson No. 2	Dry	1387
		6	Adams Corners Oil Company	W. O. Johnson No. 3	Dry	1500
		6	Hope Oil Company	Banks No. 4	175	.....
		6	Hope Oil Company	Banks No. 5	100	1347
		6	Young, Wirebach, et al	Cath. Keyser No. 5	Dry	1410
		6	Gher Oil Company	A. A. Gher No. 1	80 Nat.	1327
		7	Young et al	J. H. Stillwell	Dry	Old gas well in Bridgeport sand; dry in Biehl.
		7	Adams Corners Oil Company	Ed. Armstrong No. 2	150	.....
		7	Mahutska Oil Company	Mark Madden No. 5	Dry	.....
		7	Adams Corners Oil Company	Mark Madden No. 8	150	1393
	T. I N., R. 12 W.	1	J. S. Young, Jr., et al	Alka Heirs No. 3	20	1395
		1	Mt. Carmel Oil Company	Leek No. 6	10	1535
		2	Skidmore et al	James Kogan Heirs No. 5	150	1412

TABLE 1.—*Summary of current oil field operations in Illinois—Continued*

Location			Company	Farm and well No.	Production		Remarks
County	Township	Section			Bbls.	Depth <i>Feet</i>	
		2	Skidmore et al	James Kogan Heirs No. 6	150	1420	
		2	Skidmore et al	James Kogan Heirs No. 7	40	1440	
		2	Skidmore et al	James Kogan Heirs No. 8	175	1420	
		2	Skidmore et al	James Kogan Heirs No. 9	65	.....	
		2	Eastern Gulf Oil pany	Com-Jesse Cisel No. 3	10	1550	
		2	McColpin Brothers	John Breen No. 2	90	.....	
		5	Bell Brothers	Robert Yelton No. 3	Dry	.....	
		11	Eastern Gulf Oil pany	Com-Sallie Compton No. 1	Dry	1577	
		12	Collison Farm Oil pany	Com-Collison Heirs No. 3	125	1456	
		12	Collison Farm Oil pany	Com-Collison Heirs No. 4	25	.....	Little water.
		13	J. S. Young, Jr., et al	Joe Keyser No. 1	160	1431	
		14	J. S. Young, Jr., et al	Joe Keyser No. 2	175	.....	
		14	J. S. Young, Jr., et al	Joe Keyser No. 3	.....	.....	Water at 1446.
		15	Roberts, Smith, et al	Adam Shaeffer No. 1	Dry	1570	
		19	Healy and Lee	Chris Frick No. 2	Dry	1610	Showing.
		24	J. W. Whiteside and Com-pany	C. E. Courter No. 3	Dry	1509	

TABLE 1.—Summary of current oil field operations in Illinois—Concluded

Location			Company	Farm and well No.	Production		Remarks
County	Township	Section			Bbls.	Depth <i>Fect</i>	
Madison	Nameoki Pin Oak	1 33	Goodrich Brothers Assembly Oil and Company	Goodrich Brothers Gas Guseville	..... .....	2020	Standing. Drilling below 650.
Southwestern Illinois							
Randolph	T. 4 S., R. 6 W.	1	E. G. Mason et al	Andrews No. 1	.....	.....	Drilling below 1370 in lime; top lime, 980.
Central Field							
Macon	Hickory Point Centralia	33 4	Powers et al H. C. Higgins	A. Parish No. 1 H. C. Higgins No. 1	 Show	 1638	Standing at 1820. Drilling below 1660.
Marion		30	Petro Oil and Gas Com- pany	John Kinsey No. 14	Dry	785	
		30	Petro Oil and Gas Com- pany	A. W. Webster No. 8	Dry	796	
Morgan	T. 15 N., R. 9 W.	18	P. C. Irwin et al	Conklin	5 (Ap- prox.)	265	Sand 265-298½.
Shelby Washington	Holland Irvington	25 23	A. L. Ginther Petro Oil and Gas Com- pany	W. Prosser	.....	825	Standing.
				Louis Aldag	.....	.....	Rigged up.